



SEQUENCE LISTING

<110> University of Hawaii

<120> Baculovirus Produced Plasmodium Falciparum Vaccine

<130> A-67984

<140> US 09/500,376

<141> 2000-02-08

B
<150> US 08/195,705

<151> 1994-02-14

<160> 16

<170> PatentIn version 3.1

<210> 1

<211> 1219

<212> DNA

<213> Plasmodium falciparum

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gaatatgatg ttatatatattt aaaaccttta gctggagtat atagaagctt aaaaaaaca 180
attgaaaaaa acatttttac attaatttta aatttgaacg atatcttaaa ttcacgtctt 240
aagaaaacgaa aatatttctt agatgttatta gaatctgatt taatgcaatt taaacatata 300

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acacttttaa aaagttacaa atatataaaa gaatcagtag aaaatgatat taaatttgca	420
caggaaggtt taagttatta tgaaaaggtt ttagcgaaat ataaggatga tttagaatca	480
attaaaaaaag ttatcaaaga agaaaaggag aagttcccat catcaccacc aacaacacct	540
ccgtcaccag caaaaacaga cgaacaaaag aaggaaagta agttccttcc attttaaca	600
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caagaagggtt ataaatgtgt tgaaaatcca aatcctactt gtaacggaaa taatggtgga	1080
tgtgatgcag atgccaatg taccgaagaa gattcaggtt gcaacggaaa gaaaatcaca	1140
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<212> PRT

<213> plasmodium falciparum

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Lys Lys Gln Ile Glu Lys Asn Ile Phe Thr Phe Asn Leu Asn Leu Asn		
35	40	45

Asp Ile Leu Asn Ser Arg Leu Lys Lys Arg Lys Tyr Phe Leu Asp Val
50 55 60

Leu Glu Ser Asp Leu Met Gln Phe Lys His Ile Ser Ser Asn Glu Tyr
65 70 75 80

Ile Ile Glu Asp Ser Phe Lys Leu Leu Asn Ser Glu Gln Lys Asn Thr
85 90 95

Leu Leu Lys Ser Tyr Lys Tyr Ile Lys Glu Ser Val Glu Asn Asp Ile
100 105 110

Lys Phe Ala Gln Glu Gly Ile Ser Tyr Tyr Glu Lys Val Leu Ala Lys
115 120 125

Tyr Lys Asp Asp Leu Glu Ser Ile Lys Lys Val Ile Lys Glu Glu Lys
130 135 140

Glu Lys Phe Pro Ser Ser Pro Pro Thr Thr Pro Pro Ser Pro Ala Lys
145 150 155 160

Thr Asp Glu Gln Lys Lys Glu Ser Lys Phe Leu Pro Phe Leu Thr Asn
165 170 175

Ile Glu Thr Leu Tyr Asn Asn Leu Val Asn Lys Ile Asp Asp Tyr Leu
180 185 190

Ile Asn Leu Lys Ala Lys Ile Asn Asp Cys Asn Val Glu Lys Asp Glu
195 200 205

Ala His Val Lys Ile Thr Lys Leu Ser Asp Leu Lys Ala Ile Asp Asp
210 215 220

Lys Ile Asp Leu Phe Lys Asn His Asn Asp Phe Glu Ala Ile Lys Lys
225 230 235 240

Leu Ile Asn Asp Asp Thr Lys Lys Asp Met Leu Gly Lys Leu Leu Ser
245 250 255

Thr Gly Leu Val Gln Asn Phe Pro Asn Thr Ile Ile Ser Lys Leu Ile
260 265 270

Glu Gly Lys Phe Gln Asp Met Leu Asn Ile Ser Gln His Gln Cys Val
275 280 285

Lys Lys Gln Cys Pro Glu Asn Ser Gly Cys Phe Arg His Leu Asp Glu
290 295 300

Arg Glu Glu Cys Lys Cys Leu Leu Asn Tyr Lys Gln Glu Gly Asp Lys.
305 310 315 320

Cys Val Glu Asn Pro Asn Pro Thr Cys Asn Glu Asn Asn Gly Gly Cys
325 330 335

Asp Ala Asp Ala Lys Cys Thr Glu Glu Asp Ser Gly Ser Asn Gly Lys
340 345 350

Lys Ile Thr Cys Glu Cys Thr Lys Pro Asp Ser Tyr Pro Leu Phe Asp
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Asp Ile Leu Asn Ser Arg Leu Lys Lys Arg Lys Tyr Phe Leu Asp Val
50 55 60

Leu Glu Ser Asp Leu Met Gln Phe Lys His Ile Ser Ser Asn Glu Tyr
65 70 75 80

Ile Ile Glu Asp Ser Phe Lys Leu Leu Asn Ser Glu Gln Lys Asn Ile
85 90 95

Leu Leu Lys Ser Tyr Lys Tyr Ile Lys Glu Ser Val Glu Asn Asp Ile
100 105 110

Lys Phe Ala Gln Glu Gly Ile Ser Tyr Tyr Glu Lys Val Leu Ala Lys
115 120 125

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145 150 155 160

Thr Asp Glu Gln Lys Lys Glu Ser Lys Phe Leu Pro Phe Leu Thr Asn
165 170 175

Ile Glu Thr Leu Tyr Asn Asn Leu Val Asn Lys Ile Asp Asp Tyr Leu
180 185 190

Ile Asn Leu Lys Ala Lys Ile Asn Asp Cys Asn Val Glu Lys Asp Glu
195 200 205

Ala His Val Lys Ile Thr Lys Leu Ser Asp Leu Lys Ala Ile Asp Asp
210 215 220

Lys Ile Asp Leu Phe Lys Asn Thr Asn Asp Phe Glu Ala Ile Lys Lys
225 230 235 240

Leu Ile Asn Asp Asp Thr Lys Lys Asp Met Leu Gly Lys Leu Leu Ser
245 250 255

Thr Gly Leu Val Gln Ile Phe Pro Asn Thr Ile Ile Ser Lys Leu Ile
260 265 270

Glu Gly Lys Phe Gln Asp Met Leu Asn Ile Ser Gln His Gln Cys Val
275 280 285

Lys Lys Gln Cys Pro Glu Asn Ser Gly Cys Phe Arg His Leu Asp Glu
290 295 300

Arg Glu Glu Cys Lys Cys Leu Leu Asn Tyr Lys Gln Glu Gly Asp Lys.
305 310 315 320

Cys Glu Glu Asn Pro Asn Pro Thr Cys Asn Glu Asn Asn Gly Gly Cys
325 330 335

Asp Ala Asp Ala Thr Cys Thr Glu Glu Asp Ser Gly Ser Ser Arg Lys
340 345 350

Lys Ile Thr Cys Glu Cys Thr Lys Pro Asp Ser Tyr Pro Leu Phe Asp
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35 40 45

Lys Asp Ile Leu Asn Ser Pro Phe Asn Lys Arg Glu Asn Phe Lys Asn
50 55 60

Val Leu Glu Ser Asp Leu Ile Pro Tyr Lys Asp Leu Thr Ser Ser Asn
65 70 75 80

Tyr Val Val Lys Asp Pro Tyr Lys Phe Leu Asn Lys Glu Lys Arg Asp
85 90 95

Lys Phe Leu Ser Ser Tyr Asn Tyr Ile Lys Asp Ser Ile Asp Thr Asp
100 105 110

Ile Asn Phe Ala Asn Asp Val Leu Gly Tyr Tyr Lys Ile Leu Ser Glu
115 120 125

Lys Tyr Lys Ser Asp Leu Asp Ser Ile Lys Lys Tyr Ile Asn Asp Lys
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Leu Tyr Lys Thr Val Asn Asp Lys Ile Asp Leu Phe Val Ile His Leu
165 170 175

Glu Ala Lys Val Leu Asn Tyr Thr Tyr Glu Lys Ser Asn Val Glu Ile
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Lys Glu Leu Ile Tyr Leu Lys Thr Ile Gln Asp Lys Leu Ala Asp Phe
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Lys Lys Asn Asn Asn Phe Val Gly Ile Ala Asp Leu Ser Thr Asp Tyr
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Asn His Asn Asn Leu Leu Thr Lys Phe Leu Ser Thr Gly Met Val Phe
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Glu Asn Leu Leu Lys Ser Ile Leu Ser Asn Leu Leu Asp Trp Lys Leu
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260 265 270

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Cys Lys Cys Leu Leu Asn Tyr Lys Gln Glu Gly Ser Lys Cys Val Glu
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305 310 315 320

Ala Lys Cys Thr Glu Glu Asp Ser Gly Ser Asn Gly Lys Lys Ile Thr
325 330 335

Cys Gln Cys Thr Lys Pro Asp Ser Tyr Pro Leu Ser Met Val Ile Phe
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Lys Asp Ile Leu Asn Ser Arg Phe Asn Lys Arg Glu Asn Phe Lys Asn
50 55 60

Val Leu Glu Ser Asp Leu Ile Pro Tyr Lys Asp Leu Thr Ser Ser Asn
65 70 75 80

Tyr Val Val Lys Asp Pro Tyr Lys Phe Leu Asn Lys Glu Lys Arg Asp
85 90 95

Lys Phe Leu Ser Ser Tyr Asn Tyr Ile Lys Asp Ser Ile Asp Thr Asp
100 105 110

Ile Asn Phe Ala Asn Asp Val Leu Gly Tyr Tyr Lys Ile Leu Ser Glu
115 120 125

Lys Tyr Lys Ser Asp Leu Asp Ser Ile Lys Lys Tyr Ile Asn Asp Lys
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Gln Gly Glu Asn Glu Lys Tyr Leu Pro Phe Leu Asn Asn Ile Glu Thr
145 150 155 160

Leu Tyr Lys Thr Val Asn Asp Lys Ile Asp Leu Phe Val Ile His Leu
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Glu Ala Lys Val Leu Asn Tyr Thr Tyr Glu Lys Ser Asn Val Glu Val
180 185 190

Lys Ile Lys Glu Leu Asn Tyr Leu Lys Thr Ile Gln Asp Lys Leu Ala
195 200 205

Asp Phe Lys Lys Asn Asn Asn Phe Val Gly Ile Ala Asp Leu Ser Thr
210 215 220

Asp Tyr Asn His Asn Asn Leu Leu Thr Lys Phe Leu Ser Thr Gly Met
225 230 235 240

Val Phe Glu Asn Leu Leu Lys Ser Val Leu Ser Asn Leu Leu Asp Trp
245 250 255

Lys Leu Ala Arg Tyr Val Lys His Phe Thr Thr Pro Met Arg Lys Lys
260 265 270

Thr Met Ile Gln Gln Ser Ser Gly Cys Phe Arg His Leu Asp Glu Arg
275 280 285

Glu Glu Cys Lys Cys Leu Leu Asn Tyr Lys Gln Glu Gly Asp Lys Cys
290 295 300

Val Glu Asn Pro Asn Pro Thr Cys Asn Glu Asn Asn Gly Gly Cys Asp
305 310 315 320

Ala Asp Ala Lys Cys Thr Glu Glu Asp Ser Gly Ser Asn Gly Lys Lys.
325 330 335

Ile Thr Cys Glu Cys Thr Lys Pro Asp Cys Tyr Pro Leu Phe Asp Gly
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gcccaggaag gaatttagcta ctatgagaaa gtcctggcta aatacaagga cgacttggaa 480
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accaacatcg aaactctata taacaacctg gtgaacaaga ttgatgacta cttaatcaac 660

ttgaaggcga aaattaatga ctgtAACgtc gaaaaggatg aagcccacgt taagatcacc	720
aagctttccg atctcaaAGC catcgacgt aagattgacc tggTTAAGAA ccacaacgt	780
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Val Thr Ala Thr Leu Cys Thr Ala Gly Ala Ala Val Thr Pro Ser Val	
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att gat aac ata ctt tct aaa att gaa aat gaa tat gag gtt tta tat	146
Ile Asp Asn Ile Leu Ser Lys Ile Glu Asn Glu Tyr Glu Val Leu Tyr	
30 35 40 45	
tta aaa cct tta gca ggt gtt tat aga agt tta aaa aaa caa tta gaa	194
Leu Lys Pro Leu Ala Gly Val Tyr Arg Ser Leu Lys Lys Gln Leu Glu	
50 55 60	

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cga ttt aat aaa cgt gaa aat ttc aaa aat gtt tta gaa tca gat tta Arg Phe Asn Lys Arg Glu Asn Phe Lys Asn Val Leu Glu Ser Asp Leu 80 85 90	290
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gtt ctt gga tat tat aaa ata tta tcc gaa aaa tat aaa tca gat tta Val Leu Gly Tyr Tyr Lys Ile Leu Ser Glu Lys Tyr Lys Ser Asp Leu 145 150 155	482
gat tca att aaa aaa tat atc aac gac aaa caa ggt gaa aat gag aaa Asp Ser Ile Lys Lys Tyr Ile Asn Asp Lys Gln Gly Glu Asn Glu Lys 160 165 170	530
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tat aca tat gag aaa tca aac gta gaa gtt aaa ata aaa gaa ctt aat Tyr Thr Tyr Glu Lys Ser Asn Val Glu Val Lys Ile Lys Glu Leu Asn 210 215 220	674
tac tta aaa aca att caa gac aaa ttg gca gat ttt aaa aaa aat aac Tyr Leu Lys Thr Ile Gln Asp Lys Leu Ala Asp Phe Lys Lys Asn Asn 225 230 235	722
aat ttc gtt gga att gct gat tta tca aca gat tat aac cat aat aac Asn Phe Val Gly Ile Ala Asp Leu Ser Thr Asp Tyr Asn His Asn Asn 240 245 250	770
tta ttg aca aag ttc ctt agt aca ggt atg gtt ttt gaa aat ctt gct Leu Leu Thr Lys Phe Leu Ser Thr Gly Met Val Phe Glu Asn Leu Ala 255 260 265	818
aaa acc gtt tta tct aat tta ctt gat gga aac ttg caa ggt atg tta Lys Thr Val Leu Ser Asn Leu Leu Asp Gly Asn Leu Gln Gly Met Leu 270 275 280 285	866

aac att tca caa cac caa tgc gta aaa aaa caa tgt cca caa aat tct	914		
Asn Ile Ser Gln His Gln Cys Val Lys Lys Gln Cys Pro Gln Asn Ser			
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gga tgt ttc aga cat tta gat gaa aga gaa gaa tgt aaa tgt tta tta	962		
Gly Cys Phe Arg His Leu Asp Glu Arg Glu Glu Cys Lys Cys Leu Leu			
305	310	315	
aat tac aaa caa gaa ggt gat aaa tgt gtt gaa aat cca aat cct act	1010		
Asn Tyr Lys Gln Glu Gly Asp Lys Cys Val Glu Asn Pro Asn Pro Thr			
320	325	330	
tgt aac gaa aat aat ggt gga tgt gat gca gat gcc aaa tgt acc gaa	1058		
Cys Asn Glu Asn Asn Gly Gly Cys Asp Ala Asp Ala Lys Cys Thr Glu			
335	340	345	
gaa gat tca ggt agc aac gga aag aaa atc aca tgt gaa tgt act aaa	1106		
Glu Asp Ser Gly Ser Asn Gly Lys Lys Ile Thr Cys Glu Cys Thr Lys			
350	355	360	365
cct gat tct tat cca ctt ttc gat ggt att ttc tgc agt cat cat cat	1154		
Pro Asp Ser Tyr Pro Leu Phe Asp Gly Ile Phe Cys Ser His His His			
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Ile Leu Ser Lys Ile Glu Asn Glu Tyr Glu Val Leu Tyr Leu Lys Pro			
35	40	45	
Leu Ala Gly Val Tyr Arg Ser Leu Lys Lys Gln Leu Glu Asn Asn Val			
50	55	60	

Met Thr Phe Asn Val Asn Val Lys Asp Ile Leu Asn Ser Arg Phe Asn
65 70 75 80

Lys Arg Glu Asn Phe Lys Asn Val Leu Glu Ser Asp Leu Ile Pro Tyr
85 90 95

Lys Asp Leu Thr Ser Ser Asn Tyr Val Val Lys Asp Pro Tyr Lys Phe.
100 105 110

Leu Asn Lys Glu Lys Arg Asp Lys Phe Leu Ser Ser Tyr Asn Tyr Ile
115 120 125

Lys Asp Ser Ile Asp Thr Asp Ile Asn Phe Ala Asn Asp Val Leu Gly
130 135 140

Tyr Tyr Lys Ile Leu Ser Glu Lys Tyr Lys Ser Asp Leu Asp Ser Ile
145 150 155 160

Lys Lys Tyr Ile Asn Asp Lys Gln Gly Glu Asn Glu Lys Tyr Leu Pro
165 170 175

Phe Leu Asn Asn Ile Glu Thr Leu Tyr Lys Thr Val Asn His Lys Ile
180 185 190

Asp Leu Phe Val Ile His Leu Glu Ala Lys Val Leu Asn Tyr Thr Tyr
195 200 205

Glu Lys Ser Asn Val Glu Val Lys Ile Lys Glu Leu Asn Tyr Leu Lys
210 215 220

Thr Ile Gln Asp Lys Leu Ala Asp Phe Lys Lys Asn Asn Asn Phe Val
225 230 235 240

Gly Ile Ala Asp Leu Ser Thr Asp Tyr Asn His Asn Asn Leu Leu Thr
245 250 255

Lys Phe Leu Ser Thr Gly Met Val Phe Glu Asn Leu Ala Lys Thr Val
260 265 270

Leu Ser Asn Leu Leu Asp Gly Asn Leu Gln Gly Met Leu Asn Ile Ser
275 280 285

Gln His Gln Cys Val Lys Lys Gln Cys Pro Gln Asn Ser Gly Cys Phe
290 295 300

Arg His Leu Asp Glu Arg Glu Glu Cys Lys Cys Leu Leu Asn Tyr Lys
305 310 315 320

Gln Glu Gly Asp Lys Cys Val Glu Asn Pro Asn Pro Thr Cys Asn Glu
325 330 335

Asn Asn Gly Gly Cys Asp Ala Asp Ala Lys Cys Thr Glu Glu Asp Ser
340 345 350

Gly Ser Asn Gly Lys Lys Ile Thr Cys Glu Cys Thr Lys Pro Asp Ser
355 360 365

Tyr Pro Leu Phe Asp Gly Ile Phe Cys Ser His His His His His His
370 375 380

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<212> PRT

<213> Plasmodium falciparum

<400> 9

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<210> 10

<211> 30

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<213> Artificial Sequence

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<223> PCR primer sequences used in the construction of p42-K.

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<223> PCR primer sequences used in the construction of p42-K.

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<210> 15

<211> 43

<212> DNA

<213> Artificial Sequence

<220>

<223> PCR primer sequences used in the construction of p42-K.

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43

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<212> PRT

<213> plasmodium falciparum

<400> 16

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Gly Phe Glu Asn Glu Tyr Asp Val Ile Tyr Leu Lys Pro Leu Ala Gly
35 40 45

Val Tyr Arg Ser Leu Lys Lys Gln Ile Glu Lys Asn Ile Phe Thr Phe
50 55 60

Asn Leu Asn Leu Asn Asp Ile Leu Asn Ser Arg Leu Lys Lys Arg Lys
65 70 75 80

Tyr Phe Leu Asp Val Leu Glu Ser Asp Leu Met Gln Phe Lys His Ile
85 90 95

Ser Ser Asn Glu Tyr Ile Ile Glu Asp Ser Phe Lys Leu Leu Asn Ser
100 105 110

Glu Gln Lys Asn Thr Leu Leu Lys Ser Tyr Lys Tyr Ile Lys Glu Ser
115 120 125

Val Glu Asn Asp Ile Lys Phe Ala Gln Glu Gly Ile Ser Tyr Tyr Glu
130 135 140

Lys Val Leu Ala Lys Tyr Lys Asp Asp Leu Glu Ser Ile Lys Lys Val
145 150 155 160

Ile Lys Glu Glu Lys Glu Lys Phe Pro Ser Ser Pro Pro Thr Thr Pro
165 170 175

Pro Ser Pro Ala Lys Thr Asp Glu Gln Lys Lys Glu Ser Lys Phe Leu
180 185 190

Pro Phe Leu Thr Asn Ile Glu Thr Leu Tyr Asn Asn Leu Val Asn Lys
195 200 205

Ile Asp Asp Tyr Leu Ile Asn Leu Lys Ala Lys Ile Asn Asp Cys Asn
210 215 220

Val Glu Lys Asp Glu Ala His Val Lys Ile Thr Lys Leu Ser Asp Leu
225 230 235 240

Lys Ala Ile Asp Asp Lys Ile Asp Leu Phe Lys Asn His Asn Asp Phe
245 250 255

Asp Ala Ile Lys Lys Leu Ile Asn Asp Asp Thr Lys Lys Asp Met Leu
260 265 270

Gly Lys Leu Leu Ser Thr Gly Leu Val Gln Asn Phe Pro Asn Thr Ile
275 280 285

Ile Ser Lys Leu Ile Glu Gly Lys Phe Gln Asp Met Leu Asn Ile Ser
290 295 300

Gln His Gln Cys Val Lys Lys Gln Cys Pro Glu Asn Ser Gly Cys Phe
305 310 315 320

Arg His Leu Asp Glu Arg Glu Glu Cys Lys Cys Leu Leu Asn Tyr Lys
325 330 335

Gln Glu Gly Asp Lys Cys Val Glu Asn Pro Asn Pro Thr Cys Asn Glu
340 345 350

Asn Asn Gly Gly Cys Asp Ala Asp Ala Lys Cys Thr Glu Glu Asp Ser
355 360 365

Gly Ser Asn Gly Lys Lys Ile Thr Cys Glu Cys Thr Lys Pro Asp Ser
370 375 380

Tyr Pro Leu Phe Asp Gly Ile Phe Cys Ser Pro Pro His His His His
385 390 395 400

His His